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09/430,350	10/29/1999	MASSIMO SUTERA	P4158/PJM	7163

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EXAMINER

JONES, HUGH M

ART UNIT PAPER NUMBER

2123

DATE MAILED: 10/03/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

AK

Office Action Summary

Application No.
09/430,350

Applicant(s)
Sutera et al.

Examiner
Hugh Jones

Art Unit
2123



-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on Jun 5, 2002.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-48 is/are pending in the application.
- 4a) Of the above, claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-48 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claims _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☒ The proposed drawing correction filed on Jun 5, 2002 is: a) ☒ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
*See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s). _____ 6) ☐ Other:

Art Unit: 2123

DETAILED ACTION

Specification

1. The amendment filed 6/5/2002 is objected to under 35 U.S.C. 132 because it introduces new matter into the disclosure. 35 U.S.C. 132 states that no amendment shall introduce new matter into the disclosure of the invention. The added material which is not supported by the original disclosure includes the following changes: page 4, paragraph 3; page 5, paragraph 3 (there is only one embodiment); page 7, paragraph 1.
2. Applicant is required to cancel the new matter in the reply to this Office Action or to indicate support, in the original disclosure, for the amendments.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. **Claims 1-48 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.**

- With respect to the amendments to the claims and matter added via amendment, Section 714.02 of the MPEP states in part:

Art Unit: 2123

The prompt development of a clear issue requires that the replies of the applicant meet the objections to and rejections of the claims. ***Applicant should also specifically point out the support for any amendments made to the disclosure***. See MPEP § 2163.06.

This applies to the amendments to the claims, support for the new claims as well as support for the amendment to the specification as occur in page 4, third paragraph; page 5, third paragraph; page 7, first paragraph.

5. Claims 1-48 are also rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

- With respect to the amendments to the claims and matter added via amendment, Section 714.02 of the MPEP states in part:

The prompt development of a clear issue requires that the replies of the applicant meet the objections to and rejections of the claims. ***Applicant should also specifically point out the support for any amendments made to the disclosure***. See MPEP § 2163.06.

This applies to the amendments to the claims, support for the new claims as well as support for the amendment to the specification as occur in page 4, third paragraph; page 5, third paragraph; page 7, first paragraph.

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Art Unit: 2123

7. Claims 7-9, 18-20, 29-31, 40-42 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The phrase “*approximately but no more than*” is ambiguous - a review of the specification does not elucidate the issue.

Claim Interpretations

8. **The Examiner has given the claims their broadest reasonable interpretation.**

9. The following disclosures from the original specification are interpreted as *Applicant's Admission regarding prior art*:

- page 2 (first paragraph) is Applicant's Admission regarding prior art teaching of the relationship between drivers and noise and the use of different drivers to counteract the effects of noise;

- page 3, last paragraph, page 9, last paragraph and page 10 are Applicant's admittance regarding the ability of a skilled artisan;

- page 5, (first full paragraph) is Applicant's Admission regarding prior art teaching of curves for various driver circuits of noise amplitude vs. length of lines;

- page 5, (first full paragraph) is Applicant's Admission regarding prior art teaching of the lower susceptibility of wires to noise for stronger drivers;

Art Unit: 2123

- page 6, (second paragraph - lines 1-4) is Applicant's Admission regarding prior art teaching of criterion for noise levels.

Claim Rejections - 35 USC § 102

10. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

11. The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) do not apply to the examination of this application as the application being examined was not (1) filed on or after November 29, 2000, or (2) voluntarily published under 35 U.S.C. 122(b). Therefore, this application is examined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

12. **Claims 1-2, 7, 10-15, 29, 32-37 are rejected under 35 U.S.C. 102(e) as being clearly anticipated by Alpert et al. or Tawada.**

- *Alpert et al. ('182)* disclose a method for *optimal insertion of buffers into an integrated circuit design*. A model representative of a plurality of circuits is created where each

Art Unit: 2123

circuit has a receiving node coupled to a conductor and a source. A receiving node is selected from the modeled plurality of circuits and circuit noise is calculated for the selected receiving node utilizing the circuit model. *If the calculated circuit noise exceeds an acceptable value an optimum distance is computed from the receiving node on the conductor for buffer insertion. See "noise slack" at col. 11, for example as it relates to the recited "curves".* In a multi-sink circuit merging of the noise calculation for the two receiving circuits must be accomplished. *If an intersection of conductors exists between the receiving node and the optimum distance a set of candidate buffer locations is generated. The method then prunes inferior solutions to provide an optimal insertion of buffers.* See fig. 3-6. See entire disclosure.

- *Tawada* discloses "System and method for improving crosstalk errors via the insertion of delay gates." Tawada further discloses a system for automatically improving and removing the crosstalk error for reducing the number of designing steps, the switching timing of each net is detected from the results of path delay analysis and crosstalk analysis is carried out so as to take account of the overlap of the switching timing between a net under inspection and a neighboring net. A delay gate insertion unit inserts a delay gate to a neighboring net having timing overlap with the net under inspection undergoing crosstalk error as detected or a net on a path to which belongs the neighboring net. The delay gate inserted is such a delay gate as can improve the crosstalk and as does not produce path delay error. The delay gate inserted by the delay gate placing unit is placed on the route of the net at such a position as can improve the crosstalk error

Art Unit: 2123

of the net under inspection. An incremental wiring unit re-wires a net divided by the insertion and placing of the delay gate and a net affected by the insertion and placing of the delay gate to improve the crosstalk error automatically. See Fig. 1, 4-5, 9, 14-19 and corresponding text.

13. Claims 1-48 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by *Petschauer et al.* ('506).

14. *Petschauer et al.* ('506) disclose "Method of fabricating IC chips with equation estimated peak crosstalk voltages being less than noise margin." They further disclose that in one method according to the present invention, an integrated circuit chip is fabricated by the following steps:

1) providing a trial layout in the chip for a victim net and a set of aggressor nets which have segments that lie next to the victim net;

2) assigning to the trial layout of the victim net, the parameters of--a line capacitance, a line resistance, and a driver output resistance; and assigning to the trial layout of each aggressor net, the parameters of--a coupling capacitance to the victim net, and a voltage transition;

3) estimating, for each aggressor net, a respective peak crosstalk voltage $V_{sub,p}$ which the aggressor net couples into the victim net as a function $V_{sub,p} = K(e^{sup.-X} - e^{sup.-Y})$ where K, X, and Y are products of said parameters;

4) modifying said trial layout and repeating the assigning and estimating steps until a summation of the estimated peak crosstalk voltages in the victim net is within an acceptable level; and,

5) building the chip with the modified layout for which the summation is

Art Unit: 2123

within the acceptable level.

See fig. 4-9 and corresponding text.

Claim Rejections - 35 USC § 103

15. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

16. The factual inquiries set forth in *Graham v. John Deere Co.*, 148 USPQ 459, that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or

unobviousness.

17. **Claims 5-6, 8-9, 27-28, 30-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over [Alpert et al. (6,117,182) or Tawada] in view of (Applicant's Own Admission) or Oh et al. or Davis et al. or Yang et al. or Petschauer et al..**

Art Unit: 2123

18. Alpert et al. or Tawada teach the limitations as discussed but do not disclose that the curves define a relationship between conductor length and noise.

19. It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the teachings of (Alpert et al. or Tawada) to take into consideration of the recited curves and/or to modify the drivers for the following reasons:

- Applicants have admitted (see original specification) the following:

- page 2 (first paragraph) is Applicant's Admission regarding prior art teaching of the relationship between drivers and noise and the use of different drivers to counteract the effects of noise;

- page 3, last paragraph, page 9, last paragraph and page 10 are Applicant's admittance regarding the ability of a skilled artisan;

- page 5, (first full paragraph) is Applicant's Admission regarding prior art teaching of curves for various driver circuits of noise amplitude vs. length of lines;

- page 5, (first full paragraph) is Applicant's Admission regarding prior art teaching of the lower susceptibility of wires to noise for stronger drivers;

- page 6, (second paragraph - lines 1-4) is Applicant's Admission regarding prior art teaching of criterion for noise levels.

- *Oh et al.* disclose "*A scaling scheme and optimization methodology for deep sub-micron interconnect.*" They further disclose the requirements for interconnect in deep-submicron

Art Unit: 2123

technologies and identify critical factors that will require innovations in process technology, process integration and circuit-and-system design techniques. They also describe a scaling scheme for global lines to optimize the interconnect for a given application domain such as microprocessors, ASIC's or memory. For local interconnect they demonstrate that cross-talk is the major challenge which can be addressed by selectively using larger drivers to reduce cross-talk noise when necessary. An interconnect system optimization methodology is also presented that can be used to determine the geometry parameters of a multi-level interconnect system based on the criterion for performance and reliability. See pp. 321-322, fig. 2-4, 13-14.

- *Davis et al.* disclose "*Length, scaling, and material dependence of crosstalk between distributed RC interconnects.*" They further disclose that new general expressions for the transient response time and peak crosstalk of coupled distributed RC interconnects driven by a voltage source with finite rise-time and source impedance are presented. New compact expressions for peak crosstalk voltage reveal a previously unrecognized strong dependence of crosstalk on interconnect length, scaling, driver impedance, and materials properties for typical rise-time dominant interconnect circuits. See pg. 228, fig. 3-5.

- *Yang et al.* disclose "*Deep submicron on-chip crosstalk [and ANN prediction]*". They further disclose the effect of crosstalk using three deep submicron technologies. They start the experiment by comparing the different technologies. Then they concentrate on 0.18 μm technology to examine the effect of different parameters on the crosstalk voltage peak and circuit timing. The parameters of interest are the size of the driving and load device and the length of the

Art Unit: 2123

coupled line. The results confirmed that finer technologies cause higher impact. The magnitude of crosstalk in 0.18 /spl mu/m may be high enough to violate noise margin. Preliminary layout guidelines are deduced. To facilitate applying them to CAD tools, an ANN was used to predict crosstalk given data on the driver, the load and the length of the interconnect. See sections 2.2-4.1.

- *Petschauer et al. ('506)* disclose "*Method of fabricating IC chips with equation estimated peak crosstalk voltages being less than noise margin.*" They further disclose that in one method according to the present invention, an integrated circuit chip is fabricated by the following steps:

1) providing a trial layout in the chip for a victim net and a set of aggressor nets which have segments that lie next to the victim net;

2) assigning to the trial layout of the victim net, the parameters of--a line capacitance, a line resistance, and a driver output resistance; and assigning to the trial layout of each aggressor net, the parameters of--a coupling capacitance to the victim net, and a voltage transition;

3) estimating, for each aggressor net, a respective peak crosstalk voltage $V_{\text{sub.p}}$ which the aggressor net couples into the victim net as a function $V_{\text{sub.p}} = K(e^{\text{sup.-}X} - e^{\text{sup.-}Y})$ where K , X , and Y are products of said parameters;

4) modifying said trial layout and repeating the assigning and estimating steps until a summation of the estimated peak crosstalk voltages in the victim net is within an acceptable level; and,

Art Unit: 2123

5) building the chip with the modified layout for which the summation is within the acceptable level.

See fig. 4-9 and corresponding text.

- There are two techniques in this art to solve the crosstalk noise problem (which, by definition, inherently depends upon a criterion which defines acceptable vs. unacceptable noise) - 1) increase the driver strength and 2) insert buffers when the conductors are too long. Both were extremely well known in the art at the time of the invention. Applicants have admitted (first paragraph, page 2) that it was known to “...*increase the size of the driver supplying signals to a conductive path which is deemed to be noise sensitive.*”. Applicants have also admitted (first full paragraph, page 5) that “*It is well known that a conductive path of a given length being driven by a weak driver will have a higher susceptibility to noise than that same conductive path when driven by a stronger driver.*” These features are also disclosed in Oh et al., Davis et al., Yang et al. and Petschauer et al., as cited. If increasing the driver strength is not sufficient to solve the noise problem, then buffers would *also* be required to reduce the noise. Furthermore, If the placement of buffers is not sufficient to solve the noise problem, then increasing the strength of the drivers would *also* be required to reduce the noise.

20. Claims 3-4, 18, 21-26, 40, 43-48 are rejected under 35 U.S.C. 103(a) as being unpatentable over [Alpert et al. (6,117,182) or Tawada] in view of (Applicant’s Own Admission) or Oh et al. or Davis et al. or Yang et al. or Petschauer et al..

Art Unit: 2123

21. Alpert et al. or Tawada teach the limitations as discussed but do not disclose replacement of drivers. It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the teachings of (Alpert et al. or Tawada) to take into consideration of the recited curves and/or to modify the drivers for the following reasons:

- Applicants have admitted (see original specification) the following:

- page 2 (first paragraph) is Applicant's Admission regarding prior art teaching of the relationship between drivers and noise and the use of different drivers to counteract the effects of noise;
- page 3, last paragraph, page 9, last paragraph and page 10 are Applicant's admittance regarding the ability of a skilled artisan;
- page 5, (first full paragraph) is Applicant's Admission regarding prior art teaching of curves for various driver circuits of noise amplitude vs. length of lines;
- page 5, (first full paragraph) is Applicant's Admission regarding prior art teaching of the lower susceptibility of wires to noise for stronger drivers;
- page 6, (second paragraph - lines 1-4) is Applicant's Admission regarding prior art teaching of criterion for noise levels.
- There are two techniques in this art to solve the crosstalk noise problem (which, by definition, inherently depends upon a criterion which defines acceptable vs. unacceptable noise) -
1) increase the driver strength and 2) insert buffers when the conductors are too long. Both were

Art Unit: 2123

extremely well known in the art at the time of the invention. Applicants have admitted (first paragraph, page 2) that it was known to “...*increase the size of the driver supplying signals to a conductive path which is deemed to be noise sensitive.*”. Applicants have also admitted (first full paragraph, page 5) that “*It is well known that a conductive path of a given length being driven by a weak driver will have a higher susceptibility to noise than that same conductive path when driven by a stronger driver.*” These features are also disclosed in Oh et al., Davis et al., Yang et al. and Petschauer et al., as noted earlier. If increasing the driver strength is not sufficient to solve the noise problem, then buffers would *also* be required to reduce the noise. Furthermore, If the placement of buffers is not sufficient to solve the noise problem, then increasing the strength of the drivers would *also* be required to reduce the noise.

22. Claims 16-17, 19-20, 38-39, 41-42 are rejected under 35 U.S.C. 103(a) as being unpatentable over [Alpert et al. (6,117,182) or Tawada] in view of (Applicant’s Own Admission) or Oh et al. or Davis et al. or Yang et al. or Petschauer et al..

23. (Alpert et al. or Tawada) teach the limitations as discussed but do not disclose that the curves define a relationship between conductor length and noise and further do not disclose replacement of drivers. It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the teachings of (Alpert et al. or Tawada) to take into consideration of the recited curves and/or to modify the drivers for the following reasons:

- Applicants have admitted (see original specification) the following:

Art Unit: 2123

- page 2 (first paragraph) is Applicant's Admission regarding prior art teaching of the relationship between drivers and noise and the use of different drivers to counteract the effects of noise;
- page 3, last paragraph, page 9, last paragraph and page 10 are Applicant's admittance regarding the ability of a skilled artisan;
- page 5, (first full paragraph) is Applicant's Admission regarding prior art teaching of curves for various driver circuits of noise amplitude vs. length of lines;
- page 5, (first full paragraph) is Applicant's Admission regarding prior art teaching of the lower susceptibility of wires to noise for stronger drivers;
- page 6, (second paragraph - lines 1-4) is Applicant's Admission regarding prior art teaching of criterion for noise levels.
- There are two techniques in this art to solve the crosstalk noise problem (which, by definition, inherently depends upon a criterion which defines acceptable vs. unacceptable noise) - 1) increase the driver strength and 2) insert buffers when the conductors are too long. Both were extremely well known in the art at the time of the invention. Applicants have admitted (first paragraph, page 2) that it was known to "...*increase the size of the driver supplying signals to a conductive path which is deemed to be noise sensitive.*". Applicants have also admitted (first full paragraph, page 5) that "*It is well known that a conductive path of a given length being driven by a weak driver will have a higher susceptibility to noise than that same conductive path when*

Art Unit: 2123

driven by a stronger driver.” These features are also disclosed in Oh et al., Davis et al., Yang et al. and Petschauer et al., as noted earlier. If increasing the driver strength is not sufficient to solve the noise problem, then buffers would *also* be required to reduce the noise. Furthermore, If the placement of buffers is not sufficient to solve the noise problem, then increasing the strength of the drivers would *also* be required to reduce the noise.

24. Claims 1-2, 5-15, 27-29, 30-37 are rejected under 35 U.S.C. 103(a) as being unpatentable over [Jones et al. or Dwyer et al.] in view of (Applicant’s Own Admission) or Oh et al. or Davis et al. or Yang et al. or Petschauer et al..

- Jones et al. disclose *automated cost-based placement* (wherein *cost* includes timing and *noise*) of library cells (including buffers) and the use of Design Rule checking (DRC). See: abstract; fig. 1-3, fig. 4 (cell library and speed paths), fig. 5 (timing); col. 1-2 (general background); col. 3, lines 29-65 (details about the placement, cost function, cell library, speed, *noise*); col. 5, lines 47-60 (cell library, buffers); col. 6, lines 36-47 (goals of optimized placement); col. 7, lines 3-43 (cost and iteration); col. 8, lines 9-42 (*goals of optimized placement*); col. 9-10 (automated, iterative, cost-based layout; timing, *noise*; DRC). *Jones et al. teaches noise avoidance as one of many criteria for optimal cell placement.*

- *Dwyer et al.* disclose a method (and a system for using the method) for *placing a semiconductor circuit device between a driver and one or more receivers on the floor space of a chip*. The method includes the steps of: determining respective distances between the driver and each of the one or more receivers; determining a shortest of the distances; determining

Art Unit: 2123

midpoint along the shortest distance; determining whether the midpoint is predesignated to the floor space of one or more blocking semiconductor circuit devices; *placing the repeater at the midpoint if the midpoint is not predesignated to the one or more blocking semiconductor circuit devices; and applying a backoff algorithm to incrementally back away from the midpoint to an optimal location, and placing the repeater at the optimal location, if the midpoint is predesignated to the one or more blocking semiconductor circuit devices.* The method can also include the steps of: determining whether the to be placed semiconductor circuit device can be placed at a set of incremental locations located along one or more axes away from the midpoint; and placing the to be placed semiconductor circuit device at one of the one or more acceptable incremental locations. The step of determining the set of incremental locations can be performed in a spiral pattern away from the midpoint. *The semiconductor circuit device to be placed can be, for example, a repeater along the path of a net (length of wire) to regenerate a propagated signal.*

25. Jones et al. or Dwyer et al. teach the limitations as discussed but do not disclose that the curves define a relationship between conductor length and noise. It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the teachings of (Jones et al. or Dwyer et al.) to take into consideration of the recited curves and/or to modify the drivers for the following reasons:

- Applicants have admitted (see original specification) the following:

Art Unit: 2123

- page 2 (first paragraph) is Applicant's Admission regarding prior art teaching of the relationship between drivers and noise and the use of different drivers to counteract the effects of noise;
- page 3, last paragraph, page 9, last paragraph and page 10 are Applicant's admittance regarding the ability of a skilled artisan;
- page 5, (first full paragraph) is Applicant's Admission regarding prior art teaching of curves for various driver circuits of noise amplitude vs. length of lines;
- page 5, (first full paragraph) is Applicant's Admission regarding prior art teaching of the lower susceptibility of wires to noise for stronger drivers;
- page 6, (second paragraph - lines 1-4) is Applicant's Admission regarding prior art teaching of criterion for noise levels.
- There are two techniques in this art to solve the crosstalk noise problem (which, by definition, inherently depends upon a criterion which defines acceptable vs. unacceptable noise) - 1) increase the driver strength and 2) insert buffers when the conductors are too long. Both were extremely well known in the art at the time of the invention. Applicants have admitted (first paragraph, page 2) that it was known to "...increase the size of the driver supplying signals to a conductive path which is deemed to be noise sensitive.". Applicants have also admitted (first full paragraph, page 5) that "It is well known that a conductive path of a given length being driven by a weak driver will have a higher susceptibility to noise than that same conductive path when

Art Unit: 2123

driven by a stronger driver.” These features are also disclosed in Oh et al., Davis et al., Yang et al. and Petschauer et al., as noted earlier. If increasing the driver strength is not sufficient to solve the noise problem, then buffers would *also* be required to reduce the noise. Furthermore, If the placement of buffers is not sufficient to solve the noise problem, then increasing the strength of the drivers would *also* be required to reduce the noise.

26. Claims 3-4, 18, 21-26, 40, 43-48 are rejected under 35 U.S.C. 103(a) as being unpatentable over [Jones et al. or Dwyer et al.] in view of (Applicant’s Own Admission) or Oh et al. or Davis et al. or Yang et al. or Petschauer et al..

27. Jones et al. or Dwyer et al. teach the limitations as discussed but do not disclose replacement of drivers. It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the teachings of (Jones et al. or Dwyer et al.) to take into consideration of the recited curves and/or to modify the drivers for the following reasons:

- Applicants have admitted (see original specification) the following:

- page 2 (first paragraph) is Applicant’s Admission regarding prior art teaching of the relationship between drivers and noise and the use of different drivers to counteract the effects of noise;

- page 3, last paragraph, page 9, last paragraph and page 10 are Applicant’s admittance regarding the ability of a skilled artisan;

Art Unit: 2123

- page 5, (first full paragraph) is Applicant's Admission regarding prior art teaching of curves for various driver circuits of noise amplitude vs. length of lines;
- page 5, (first full paragraph) is Applicant's Admission regarding prior art teaching of the lower susceptibility of wires to noise for stronger drivers;
- page 6, (second paragraph - lines 1-4) is Applicant's Admission regarding prior art teaching of criterion for noise levels.
- There are two techniques in this art to solve the crosstalk noise problem (which, by definition, inherently depends upon a criterion which defines acceptable vs. unacceptable noise) - 1) increase the driver strength and 2) insert buffers when the conductors are too long. Both were extremely well known in the art at the time of the invention. Applicants have admitted (first paragraph, page 2) that it was known to "...*increase the size of the driver supplying signals to a conductive path which is deemed to be noise sensitive.*". Applicants have also admitted (first full paragraph, page 5) that "*It is well known that a conductive path of a given length being driven by a weak driver will have a higher susceptibility to noise than that same conductive path when driven by a stronger driver.*" These features are also disclosed in Oh et al., Davis et al., Yang et al. and Petschauer et al., as noted earlier. If increasing the driver strength is not sufficient to solve the noise problem, then buffers would *also* be required to reduce the noise. Furthermore, If the placement of buffers is not sufficient to solve the noise problem, then increasing the strength of the drivers would *also* be required to reduce the noise.

Art Unit: 2123

28. Claims 16-17, 19-20, 38-39, 41-42 are rejected under 35 U.S.C. 103(a) as being unpatentable over [Jones et al. or Dwyer et al.] in view of (Applicant's Own Admission) or Oh et al. or Davis et al. or Yang et al. or Petschauer et al..

29. Jones et al. or Dwyer et al. teach the limitations as discussed but do not disclose that the curves define a relationship between conductor length and noise and further do not disclose replacement of drivers. It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the teachings of (Jones et al. or Dwyer et al.) to take into consideration of the recited curves and/or to modify the drivers for the following reasons:

- Applicants have admitted (see original specification) the following:

- page 2 (first paragraph) is Applicant's Admission regarding prior art teaching of the relationship between drivers and noise and the use of different drivers to counteract the effects of noise;

- page 3, last paragraph, page 9, last paragraph and page 10 are Applicant's admittance regarding the ability of a skilled artisan;

- page 5, (first full paragraph) is Applicant's Admission regarding prior art teaching of curves for various driver circuits of noise amplitude vs. length of lines;

- page 5, (first full paragraph) is Applicant's Admission regarding prior art teaching of the lower susceptibility of wires to noise for stronger drivers;

Art Unit: 2123

- page 6, (second paragraph - lines 1-4) is Applicant's Admission regarding prior art teaching of criterion for noise levels.

- There are two techniques in this art to solve the crosstalk noise problem (which, by definition, inherently depends upon a criterion which defines acceptable vs. unacceptable noise) - 1) increase the driver strength and 2) insert buffers when the conductors are too long. Both were extremely well known in the art at the time of the invention. Applicants have admitted (first paragraph, page 2) that it was known to "*...increase the size of the driver supplying signals to a conductive path which is deemed to be noise sensitive.*". Applicants have also admitted (first full paragraph, page 5) that "*It is well known that a conductive path of a given length being driven by a weak driver will have a higher susceptibility to noise than that same conductive path when driven by a stronger driver.*" These features are also disclosed in Oh et al., Davis et al., Yang et al. and Petschauer et al., as noted earlier. If increasing the driver strength is not sufficient to solve the noise problem, then buffers would *also* be required to reduce the noise. Furthermore, If the placement of buffers is not sufficient to solve the noise problem, then increasing the strength of the drivers would *also* be required to reduce the noise.

Response to Arguments - (paper # 7)

30. Applicant's arguments have been fully considered, but they are not persuasive.

Art Unit: 2123

Response to Arguments - Information Disclosure Statement

31. Applicants have been silent in response to this request. Applicants have not provided an IDS. The Examiner notes that while the alleged deficiencies of prior art have been discussed in the specification (see section 2 [“the background art”] of the specification, for example), and Applicants have admitted that the concepts expressed in figure 2 are prior art, there has been no mention, in an IDS, of such prior art. The Examiner extends full faith and credit to Applicants, based on their silence, that they are not aware of relevant prior art.

Response to Arguments - Drawings (pg. 17, paper # 7)

32. The objection is withdrawn in view of the corrected drawings.

Response to Arguments - 101 Rejections (pg. 18, paper # 7)

33. The rejection is withdrawn in view of the claim amendments (paper # 7).

Response to Arguments - 102 Rejections (pg. 18, paper # 7)

34. Applicants arguments relating to “curves” are moot in view of the new rejections.

Response to Arguments - 103 Rejections (pp. 19-20, paper # 7)

35. Applicant’s arguments are not persuasive. In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually

Art Unit: 2123

where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). Furthermore, Applicants have argued that the **combination** of Jones et al. and Alpert et al. and Dwyer et al. do not teach the claimed invention. The Examiner would like to point out that the rejection was:

“Claims 3-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over [Jones et al. or Alpert et al. (6,117,182) or Dwyer et al.] **in view of Applicant’s Own Admission.**”

Applicants are silent as to **asserted** combination or **the teaching of Applicant’s Own Admission**.

36. Applicants arguments relating to “curves” are moot in view of the new rejections.

Conclusion

37. Applicant’s amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a).

Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

38. A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however,

Art Unit: 2123

will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

39. Any inquiry concerning this communication or earlier communications from the examiner should be:

directed to:

Dr. Hugh Jones telephone number (703) 305-0023, Monday-Thursday 0830 to 0700 ET, *or* the examiner's supervisor, Kevin Teska, telephone number (703) 305-9704. Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist, telephone number (703) 305-3900.

mailed to:

Commissioner of Patents and Trademarks
Washington, D.C. 20231

or faxed to:

(703) 308-9051 (for formal communications intended for entry)
or (703) 308-1396 (for informal or draft communications, please label "*PROPOSED*" or "*DRAFT*").

Dr. Hugh Jones

September 30, 2002

Hugh Jones
DR. HUGH M. JONES
PATENT EXAMINER
ART UNIT 2123
primary